

**Amendment and Response**

Applicant: Niranjan Damera-Venkata et al.

Serial No.: 10/762,845

Filed: September 26, 2003

Docket No.: 200312385-1

Title: GENERATING AND DISPLAYING SPATIALLY OFFSET SUB-FRAMES**RECEIVED  
CENTRAL FAX CENTER****AUG 31 2006****REMARKS**

This is responsive to the Non-Final Office Action mailed July 7, 2006. In that Office Action, the Examiner rejected claims 1, 2, 4, 16-18, 22, and 24 under 35 U.S.C. §103(a) as being unpatentable over Gibbon et al., U.S. Publication No. 2003/0020809 ("Gibbon") in view of Chao et al., U.S. Patent No. 6,711,299 ("Chao"). The Examiner's indication that claims 3, 5, 6-15, 19-21, and 23 although objected to, would be deemed allowable if re-written in independent form, is noted with appreciation.

With this Response, claim 1 has been amended. Claims 1-24 remain pending in the application and are presented for reconsideration and allowance.

**35 U.S.C. §103 Rejections**

The Examiner rejected claims 1, 2, 4, 16-18, 22, and 24 under 35 U.S.C. §103(a) as being unpatentable over Gibbon et al., U.S. Publication No. 2003/0020809 ("Gibbon") in view of Chao et al., U.S. Patent No. 6,711,299 ("Chao"). Amended independent claim 1 recites "reducing a bit-depth of the first and the second sub-frames differently based on different quantization equations in a first set of quantization equations, thereby generating a first dithered sub-frame and a second dithered sub-frame; and alternating between displaying the first dithered sub-frame in a first position and displaying the second dithered sub-frame in a second position spatially offset from the first position."

With respect to claim 1, the Examiner stated that:

Gibbon et al. does not disclose reducing a bit-depth of the first and the second sub-frames based on a first set of quantization equations, thereby generating a first dithered sub-frame and a second dithered sub-frame.

Chao et al. teaches reducing a bit-depth based on a first set of quantization equations, thereby generating dithered pixel values (See Fig. 10, items steps 140, 142, 144, from Col. 10, Line 50 to Col. 11, Line 3). (Office Action at para. no. 2, page 3).

Chao discloses that different quantizations may be used for different quadrants (blocks or sub-bands) of a set of wavelet coefficients for an image. (See, e.g., Chao at col. 5, line 66 to col. 6, line 57; col. 7, lines 24-39; col. 10, lines 24-39; and col. 26, line 55 to col. 27, line 7). However, Chao does not teach or suggest using different quantizations for two

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different sub-frames. Chao does not teach or suggest reducing a bit-depth of first and second sub-frames differently based on different quantization equations in a first set of quantization equations, as recited in amended independent claim 1.

In addition, the cited references do not teach or suggest “displaying the first dithered sub-frame in a first position and displaying the second dithered sub-frame in a second position spatially offset from the first position”. There is no teaching or suggestion in Gibbon regarding displaying dithered sub-frames. Chao discloses quantization and dithering as part of a compression process. However, the compressed images disclosed in Chao are not displayed. Rather, the compressed images go through a decompression process, including de-quantizing, prior to display. (See, e.g., Chao at col. 7, lines 8-17; col. 9, lines 33-37; col. 10, lines 6-8 and 40-49; col. 11, lines 4-11). There is no teaching or suggestion in Chao regarding displaying dithered sub-frames.

In view of the above, independent claim 1 is not taught or suggested by Gibbon and Chao. In addition, dependent claims 2 and 4, which further limit patentably distinct claim 1, are also believed to be allowable over the cited references. Withdrawal of the rejection of claims 1, 2, and 4 under 35 U.S.C. § 103, and allowance of claims 1, 2, and 4, are respectfully requested.

Independent claim 16 recites “a display device adapted to alternately display the first dithered sub-frame in a first position and the second dithered sub-frame in a second position spatially offset from the first position.” There is no teaching or suggestion in Gibbon regarding displaying dithered sub-frames. Chao discloses quantization and dithering as part of a compression process. However, the compressed images disclosed in Chao are not displayed. Rather, the compressed images go through a decompression process, including de-quantizing, prior to display. (See, e.g., Chao at col. 7, lines 8-17; col. 9, lines 33-37; col. 10, lines 6-8 and 40-49; col. 11, lines 4-11). There is no teaching or suggestion in Chao regarding displaying dithered sub-frames.

In view of the above, independent claim 16 is not taught or suggested by Gibbon and Chao. In addition, dependent claims 17 and 18, which further limit patentably distinct claim 16, are also believed to be allowable over the cited references. Withdrawal of the rejection of

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claims 16-18 under 35 U.S.C. § 103, and allowance of claims 16-18, are respectfully requested.

Independent claim 22 is directed to "a system for generating low resolution dithered sub-frames for display at spatially offset positions to generate the appearance of a high resolution image", and recites "means for spatially and temporally dithering the plurality of sets of low resolution sub-frames to generate a corresponding plurality of sets of low resolution dithered sub-frames". There is no teaching or suggestion in Gibbon regarding displaying dithered sub-frames. Chao discloses quantization and dithering as part of a compression process. However, the compressed images disclosed in Chao are not displayed. Rather, the compressed images go through a decompression process, including de-quantizing, prior to display. (See, e.g., Chao at col. 7, lines 8-17; col. 9, lines 33-37; col. 10, lines 6-8 and 40-49; col. 11, lines 4-11). There is no teaching or suggestion in Chao regarding displaying dithered sub-frames.

In addition, there is no teaching or suggestion in Chao regarding temporally dithering sub-frames.

With respect to claim 22, the Examiner stated that:

Gibbon et al. does not disclose means for spatially and temporally dithering the plurality of sets of low resolution sub-frames to generate a corresponding plurality of sets of low resolution dithered sub-frames.

Chao et al. teaches reducing a bit-depth based on a first set of quantization equations, thereby generating dithered pixel values (See Fig. 10, items steps 140, 142, 144, from Col. 10, Line 50 to Col. 11, Line 3). (Office Action at para. no. 2, page 4).

The specification of the present Application discloses that:

The use of different quantizing functions for a single frame provides a spatial dithering function, and the use of different quantizing functions from frame to frame provides a temporal dithering function. The use of different quantizing functions in this manner is referred to herein as spatio-temporal dithering. (Specification at page 24, lines 18-22).

Chao discloses that different quantizations may be used for different quadrants (blocks or sub-bands) of a set of wavelet coefficients for an image. (See, e.g., Chao at col. 5, line 66 to col. 6, line 57; col. 7, lines 24-39; col. 10, lines 24-39; and col. 26, line 55 to col.

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27, line 7). However, Chao does not teach or suggest using different quantizations for consecutive images. Chao does not teach or suggest temporal dithering of sub-frames, or using different quantizing functions from frame to frame.

In view of the above, independent claim 22 is not taught or suggested by Gibbon and Chao. Withdrawal of the rejection of claim 22 under 35 U.S.C. § 103, and allowance of claim 22, are respectfully requested.

Independent claim 24 is directed to "a computer-readable medium having computer-executable instructions for performing a method of generating low resolution **dithered sub-frames for display at spatially offset positions to generate the appearance of a high resolution image**", and recites "quantizing each set of sub-frames corresponding to high resolution images in the first set based on a first plurality of dither values; quantizing each set of sub-frames corresponding to high resolution images in the second set based on a **second plurality of dither values that is different than the first plurality of dither values**; and wherein the quantizing steps provides a spatial and **temporal dither** of the sub-frames."

There is no teaching or suggestion in Gibbon regarding displaying dithered sub-frames. Chao discloses quantization and dithering as part of a compression process. However, the compressed images disclosed in Chao are not displayed. Rather, the compressed images go through a decompression process, including de-quantizing, prior to display. (See, e.g., Chao at col. 7, lines 8-17; col. 9, lines 33-37; col. 10, lines 6-8 and 40-49; col. 11, lines 4-11). There is no teaching or suggestion in Chao regarding displaying dithered sub-frames.

In addition, there is no teaching or suggestion in Chao regarding temporally dithering sub-frames, or using different pluralities of dither values for different pluralities of sub-frames.

With respect to claim 24, the Examiner stated that:

Gibbon et al. does not disclose quantizing each set of sub-frames corresponding to high resolution images in the first set based on a first plurality of dither values; quantizing each set of sub-frames corresponding to high resolution images in the second set based on a second plurality of dither values that is different than the first plurality of dither values; and wherein the quantizing steps provides a spatial and temporal dither of the sub-frames.

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Chao et al. teaches reducing a bit-depth based on a first set of quantization equations, thereby generating dithered pixel values (See Fig. 10, items steps 140, 142, 144, from Col. 10, Line 50 to Col. 11, Line 3). (Office Action at para. no. 2, pages 5-6).

The specification of the present Application discloses that:

The use of different quantizing functions for a single frame provides a spatial dithering function, and the use of different quantizing functions from frame to frame provides a temporal dithering function. The use of different quantizing functions in this manner is referred to herein as spatio-temporal dithering. (Specification at page 24, lines 18-22).

Chao discloses that different quantizations may be used for different quadrants (blocks or sub-bands) of a set of wavelet coefficients for an image. (See, e.g., Chao at col. 5, line 66 to col. 6, line 57; col. 7, lines 24-39; col. 10, lines 24-39; and col. 26, line 55 to col. 27, line 7). However, Chao does not teach or suggest temporal dithering of sub-frames, or using different pluralities of dither values for different pluralities of sub-frames.

In view of the above, independent claim 24 is not taught or suggested by Gibbon and Chao. Withdrawal of the rejection of claim 24 under 35 U.S.C. § 103, and allowance of claim 24, are respectfully requested.

**CONCLUSION**

In view of the above, Applicant respectfully submits that pending claims 1-24 are in form for allowance and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1-24 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(h)(i). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 08-2025.

The Examiner is invited to contact the Applicant's representative at the below-listed telephone numbers to facilitate prosecution of this application.

Any inquiry regarding this Amendment and Response should be directed to either Jeff A. Holmen at Telephone No. (612) 573-0178, Facsimile No. (612) 573-2005 or Denise L.

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Saffold at Telephone No. (650) 236-4868, Facsimile No. (650) 852-8063. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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**CERTIFICATE UNDER 37 C.F.R. 1.8:**

The undersigned hereby certifies that this paper or papers, as described herein, are being transmitted via facsimile to Facsimile No. (571) 273-8300 on this 31st day of August, 2006.

By: \_\_\_\_\_  
Name: Jeff A. Holmen